

Date: Tuesday, 01/05/2007 2:24:01 PM
 User: Linda Locelle

Process Sheet

Split 2005-16

Drawing Name

: GUIDE ASSEMBLY

Customer : CU-DAR001 Dart Helicopters Services

Job Number : 31870-3

Estimate Number : 12709

P.O. Number : N/A

This Issue : 01/05/2007

Prsht Rev. : NC

First Issue : N/A

Previous Run : 31870

S.O. No. : N/A

Type : LARGE FAB ASSY

Part Number

: D3572041

Drawing Number

: D3572 REV.B

Project Number

: N/A

Drawing Revision

: B

Material

: N/A

Due Date

: 13/05/2007

Qty:

60 Um:

Each

PTO

Written By

Checked & Approved By

Comment

Est Rev: A New Issue 07-02-07 JLM
 est rev B revB dwg EC

Additional Product

PTO
Last Page

Job Number:

Seq. #:

Machine Or Operation:

Description :

1.0

D35723

GUIDE

Comment: Qty.: 4.0000 Each(s)/Unit Total: 240.0000 Each(s)

GUIDE

Batch: ~~B31912~~

B3217-2 x24

FC 07 11 13 (11)
~~PD 07 05 15 (14)~~

2.0

D35727

CAP

Comment: Qty.: 2.0000 Each(s)/Unit Total: 120.0000 Each(s)

CAP

Batch: ~~B31914~~

B31914

FC 07 11 13 (11)
~~PD 07 05 15 (14)~~

3.0

D35725

BRACKET

Comment: Qty.: 1.0000 Each(s)/Unit Total: 60.0000 Each(s)

BRACKET

Batch: ~~B31913~~

B31913

FC 07 11 13 (11)
~~PD 07 05 15 (14)~~

4.0

M6061T6T1000W188

6061T6 TUBE 1.00 X .188W

Comment: Qty.: 2.3405 f(s)/Unit Total: 140.4270 f(s)

6061-T6 Round Tube 1.00"x 0.188 wall

Batch: ~~M18101~~

M18147
 30.426
 SUBSTITUTE 1" OD 6061-T6 Rod

LARGE FABRICATION RESOURCE 1

X11

5.0

LARGE FAB 1

Comment: LARGE FABRICATION RESOURCE 1

1-Cut Tube D3572-1 as per Dwg D3572

2.8 07/05/11 (12)



Date: Tuesday, 01/05/2007 2:24:01 PM
User: Linda Lacelle

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: GUIDE ASSEMBLY

Job Number: 31870

Part Number: D3572041

Job Number:



Seq. #: Machine Or Operation: Description :

2-Weld D3572-3 guides, D3572-7 caps and D3572-5 bracket as per Dwg D3572
A/R AL ROD Batch: ~~M102756~~
M105058

3-Grind welds for end caps.

FC 07/11/15
D 07-05-15
P10 (11)
P10 (14)
LAST PASS

6.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP



7.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION



8.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1



9.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat Grey Sandtex (Ref. 4.3.5.6) as per QSI 005 4.3



10.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION



11.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: 247



12.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE



Job Completion



U 07-05-16
U 07-12-11

Date: Tuesday, 4/17/2007 11:13:58 AM
 User: Kim Johnston

Process Sheet

| | |
|------------------------------------------------|---------------------------------------|
| Customer : CU-DAR001 Dart Helicopters Services | Drawing Name : GUIDE ASSEMBLY |
| Job Number : 31870 | |
| Estimate Number : 12709 | |
| P.O. Number : | Part Number : D3572041 |
| This Issue : 4/17/2007 S.O. No. : | Drawing Number : D3572 UNDER REVIEW |
| Prsht Rev. : NC | Project Number : N/A |
| First Issue : / / Type : LARGE FAB ASSY | Drawing Revision : U/R |
| Previous Run : 31462 | Material : |
| Written By : _____ | Due Date : 5/12/2007 Qty: 60 Um: Each |
| Checked & Approved By : _____ | |
| Comment : Est Rev: A New Issue 07-02-07 JLM | |

Additional Product

Job Number:



| | | |
|---------|-----------------------|---------------|
| Seq. #: | Machine Or Operation: | Description : |
|---------|-----------------------|---------------|

| | | |
|-----|--------|-------|
| 1.0 | D35723 | GUIDE |
|-----|--------|-------|



Comment: Qty.: 2.0000 Each(s)/Unit Total : 120.0000 Each(s)
 GUIDE
 Batch: _____

| | | |
|-----|--------|-----|
| 2.0 | D35727 | CAP |
|-----|--------|-----|



Comment: Qty.: 2.0000 Each(s)/Unit Total : 120.0000 Each(s)
 CAP
 Batch: _____

| | | |
|-----|--------|---------|
| 3.0 | D35725 | BRACKET |
|-----|--------|---------|



Comment: Qty.: 1.0000 Each(s)/Unit Total : 60.0000 Each(s)
 BRACKET
 Batch: _____

| | | |
|-----|-------------------|--------------------------|
| 4.0 | M6061T6TS0750W062 | 6061-T6 SQ Tube.75x.062W |
|-----|-------------------|--------------------------|



Comment: Qty.: 2.3405 f(s)/Unit Total : 140.4270 f(s)
 6061-T6 SQ Tube.75x.062W
 Batch: _____

| | | |
|-----|-------------|------------------------------|
| 5.0 | LARGE FAB 1 | LARGE FABRICATION RESOURCE 1 |
|-----|-------------|------------------------------|



Comment: LARGE FABRICATION RESOURCE 1
 1-Cut Tube to 26.75" as per Dwg D3572

 2-drill & mill per dwg D3572

 2-Weld as per Dwg D3572

PT3
 PT5
 LAST PAGE

Date: Tuesday, 4/17/2007 11:13:59 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: GUIDE ASSEMBLY

Job Number: 31870

Part Number: D3572041

Job Number:



Seq. #: Machine Or Operation: Description :

A/R AL ROD

Batch: _____

3-Grind welds for end caps.

6.0

QC5

INSPECT WORK TO CURRENT STEP



PHD →
Last Page

Comment: INSPECT WORK TO CURRENT STEP

7.0

QC9

VISUAL WELDING INSPECTION



Comment: VISUAL WELDING INSPECTION

8.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

9.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat Grey Sandtex (Ref: 4.3.5.6) as per QSI 005 4.3

10.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

11.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: _____

12.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

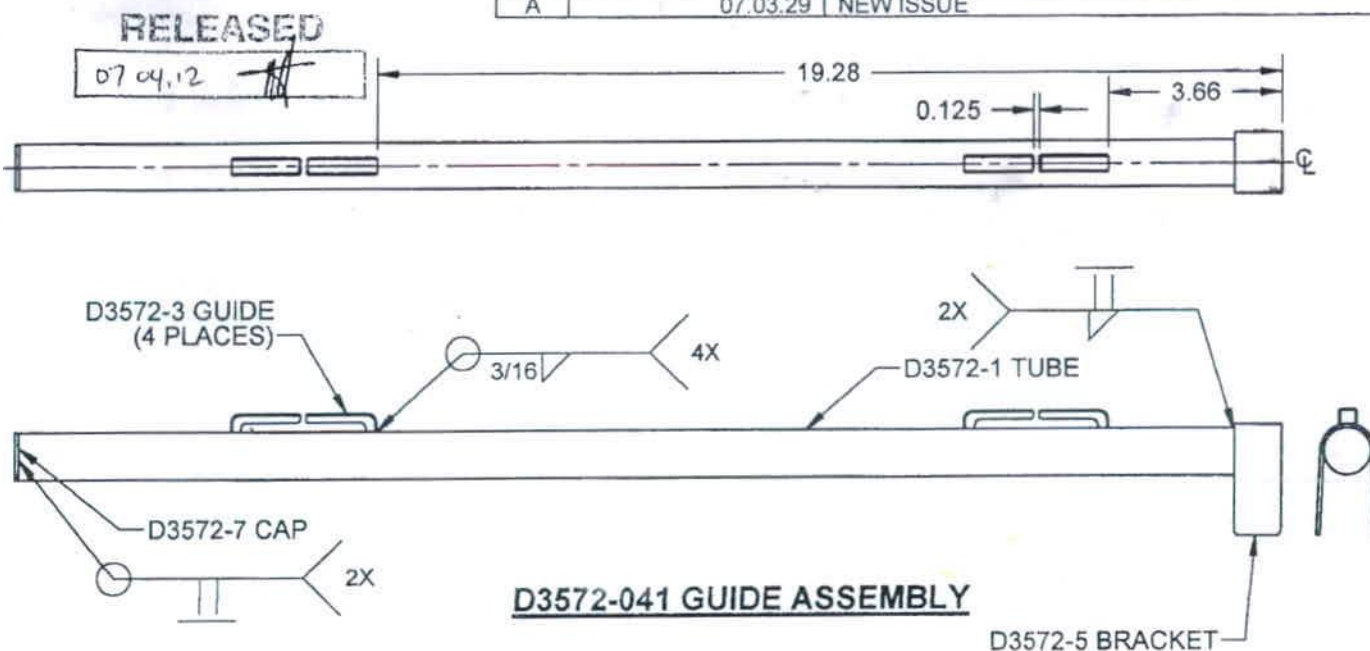
Job Completion



u 9-05-16

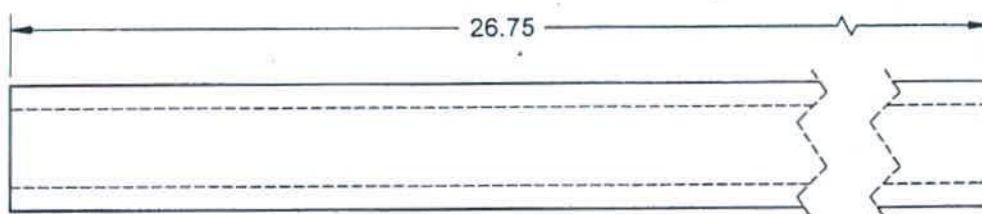


| | | | |
|---------------------|-------------------------|---------------------------------------------------|------------------------|
| DESIGN <i>LE</i> | DRAWN BY <i>LE</i> | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | |
| CHECKED <i>#</i> | APPROVED <i>#</i> | DRAWING NO. D3572 | REV. A SHEET 1 OF 2 |
| DATE 07.03.29 | TITLE GUIDE ASSEMBLY | | SCALE 1:4 |
| REV A | DATE 07.03.29 | DESCRIPTION NEW ISSUE | |



D3572-041 NOTES:

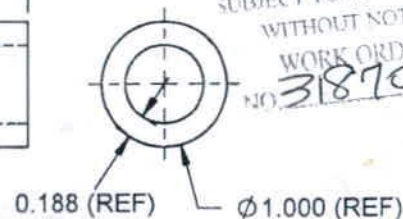
- 1) PART IS SYMMETRIC ABOUT CENTERLINE
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
POWDER COAT GREY SANDTEX (4.3.5.6) PER DART QSI 005 4.3
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) IDENTIFY WITH DART P/N "D3572-041" USING FINE POINT PERMANENT INK MARKER
- 5) ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
- 6) WELD PER DART QSI 004



D3572-1 TUBE

D3572-1 NOTES:

- 1) MATERIAL: 6061-T6 (OR T62) ALUMINUM TUBE 1.00 OD X 0.188 WALL
PER WW-T-700/6 OR AMS 4080 OR AMS 4082 OR QQ-A-225/8 OR QQ-A-225/8
(REF DART SPEC M6061T6T1.000W.188)
- 2) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 3) ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
- 4) BREAK ALL SHARP EDGES 0.005 TO 0.010 MAX



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NO. 31870

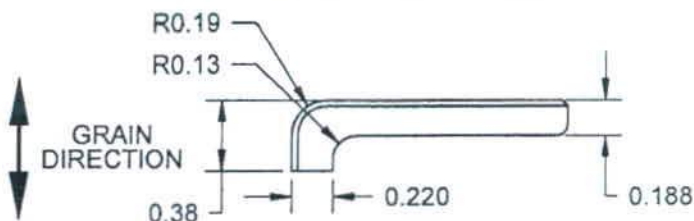
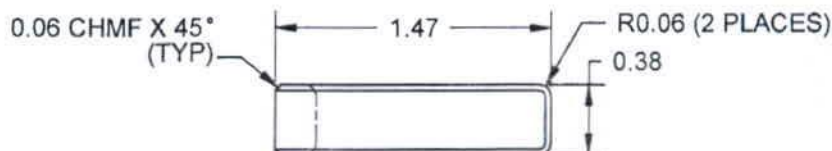
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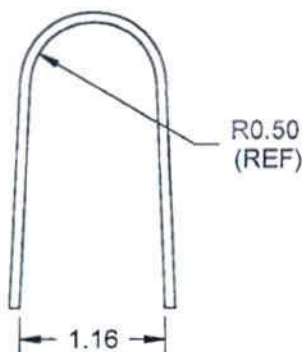
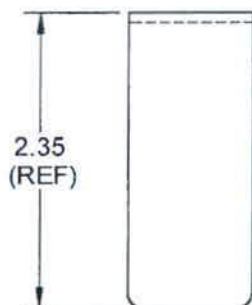
| | | | |
|-------------------------------|--------------------------------|---------------------------------------------------|------------------------|
| DESIGN <i>LE</i> | DRAWN BY <i>LE</i> | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | |
| CHECKED <i>[Signature]</i> | APPROVED <i>[Signature]</i> | DRAWING NO. D3572 | REV. A SHEET 2 OF 2 |
| DATE 07.03.29 | TITLE GUIDE ASSEMBLY | | SCALE 2:3 |



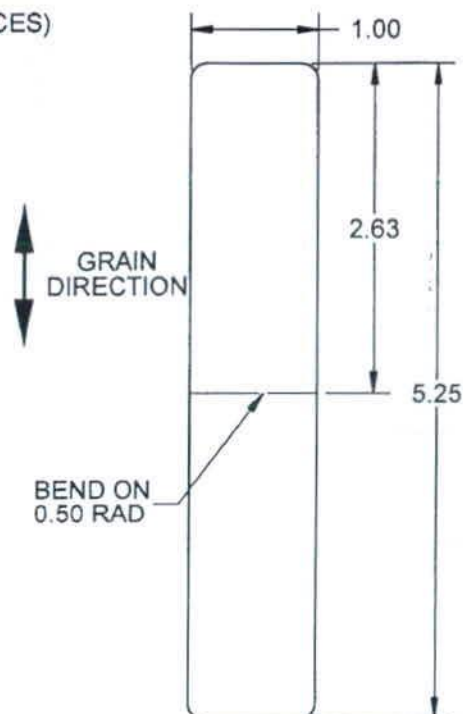
1 **D3572-3 GUIDE**

RELEASED

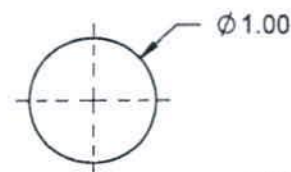
07.04.12 *[Signature]*



D3572-5 BRACKET
(MAKE FROM D3572-5F)



2 **D3572-5F FLAT PATTERN**



2 **D3572-7 CAP**

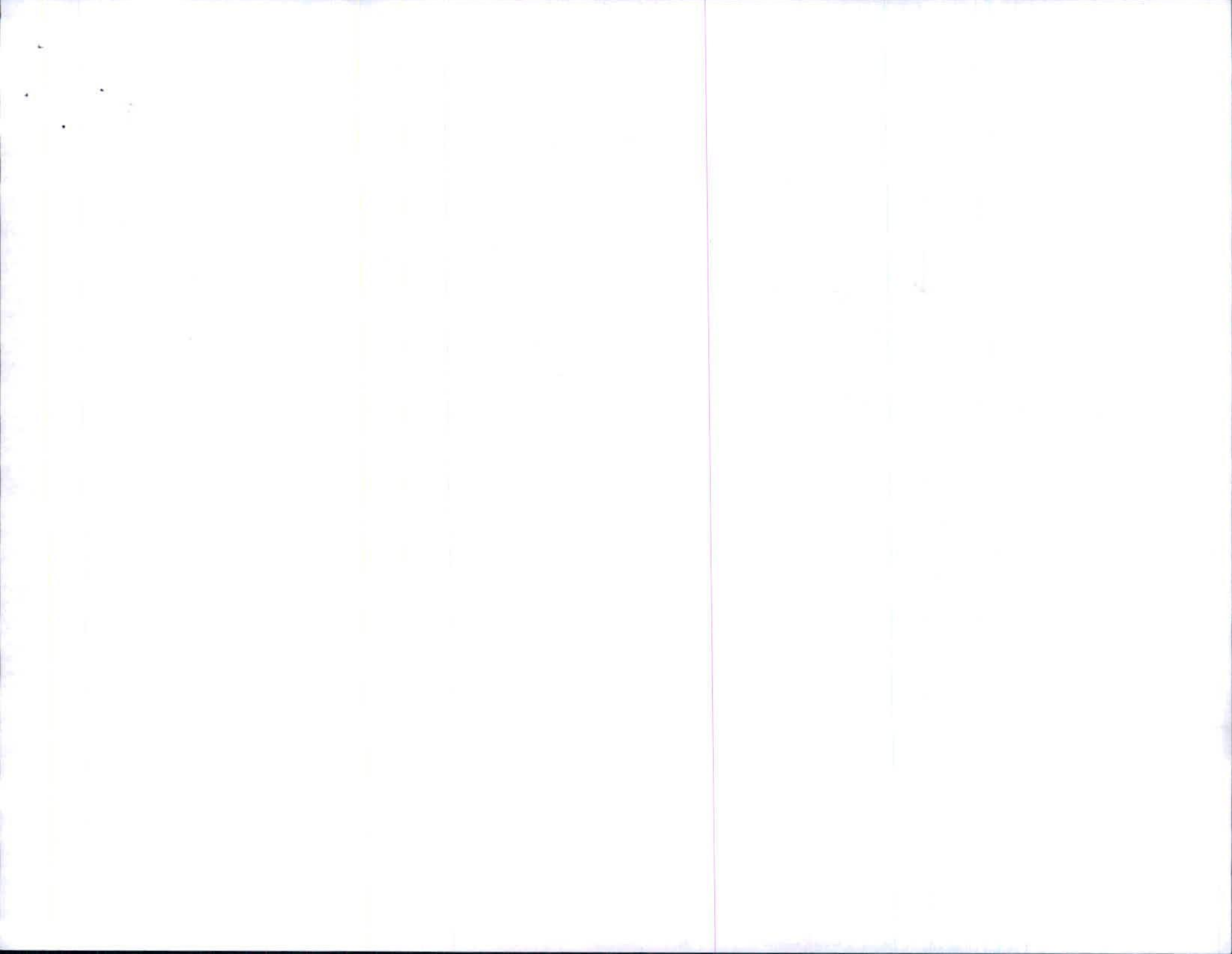
D3572-3/-5/-7 NOTES:

- 1) D3572-3 MATERIAL: 6061-T6 (OR T651/T6510/T651/T62) ALUMINUM BAR PER QQ-A-225/8 (OR AMS 4117/4128/4115/4116) OR QQ-A-200/8 (OR AMS 4160) (REF DART SPEC M6061T6B)
- 2) D3572-5/-7 MATERIAL: 6061-T6 (OR T62) ALUMINUM SHEET 0.080 THICK PER QQ-A-250/11 OR AMS 4025 OR 4027 (REF DART SPEC M6061T6S.080)
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
- 5) BREAK ALL SHARP EDGES 0.005 TO 0.010 MAX

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31870




Leanne Elsliger

From: Leanne Elsliger [lelsiger@dartaero.com]
Sent: May 15, 2007 1:16 PM
To: 'David Shepherd'
Subject: D3572-041

Attachments: D3572-041 weld pics 004.jpg; D3572-041 weld pics 001.jpg; D3572-041 weld pics 007.jpg

David – attached are weld pics of D3572-041 (pics 001 and 004). The part at the top of the picture is the part we tested at our official structural test.

Pic 007 is the part we pulled today (guide welded on solid rod). It shows the deflection after 300 lbs weight was applied for about 5 seconds. 

Here is a list of the load applied and the measured deflection of that guide:

80 lbs – 0.03 deflection
 100 lbs – 0.05 deflection
 110 lbs – 0.07 deflection
 125 lbs – 0.08 deflection
 140 lbs – 0.09 deflection (part examined for cracks on outside – none found)
 200 lbs – 0.18 deflection
 250 lbs – 0.22 deflection
 300 lbs – 0.24 deflection (part removed from test jig – small crack found where weld meets guide on inside)
 The ultimate load for upward load is 135.6 per occupant.

Leanne

Leanne Elsliger, P.Eng
 Design Engineer
 Dart Aerospace Ltd.
 1270 Aberdeen St.
 Hawkesbury, ON, K6A 1K7
 T: (613) 632-5200
 F: (613) 632-9311

ADDITIONAL TESTING PERFORMED ON SECOND SAMPLE:

- APPLIED UP TO 350 lbs ON ONE GUIDE (IE 2x D3572-3) WITH NO FAILURE

↳ SOME DEFLECTION OBSERVED, WHICH IS ACCEPTABLE BECAUSE PART WAS SUBSTANTIATED TO ULTIMATE LOADS.

LE 07.05.16.



Leanne Elsliger

From: David Shepherd [dshepherd@dartaero.com]
Sent: May 15, 2007 2:20 PM
To: 'Leanne Elsliger'
Cc: 'Bill Beckett'; 'Peggy McDonald'; 'Linda Lacelle'; 'Jason Murdoch'
Subject: Shoulder Harness Kits

Leanne,

I have looked at the pictures you have sent me regarding the D3572-041 guide assemblies and believe that the parts made with the solid bar (substitute material) are NOT of the same quality as the parts made with the tubing (proper material) for the following reasons:

- a) size of the weld
- b) straightness of the guides
- c) reduced space for the shoulder strap to slide through the guide causing premature belt wear
- d) kit is marginally heavier than we intended

I have talked to Peggy to find out how much of a panic the customers are in for these kits. She has talked to her customers discretely and found that 3 of the 5 kits are an absolute panic. Linda says we will have the proper tubing material on Friday.

Based on the structural testing that you have performed, I do not believe there is a structural issue here.

Therefore, my recommendation is that YOU PERSONALLY select the 6 BEST out of the 14 bars that we have made this morning based on a), b), and c) above and that we complete and ship the kits to the 3 panic customers (2 x Helicopter Express and 1 x Rogers Helicopters) and that we SCRAP the other 8 bars. The remaining kits should be shipped next week with the proper material.

Thanks for bringing this to my attention.

David

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.467 / Virus Database: 269.7.1/805 - Release Date: 5/15/2007 10:47 AM

16/05/2007



Dart Aerospace Ltd

| | | | | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|--|
| W/O: | | WORK ORDER CHANGES | | | | | | |
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector | |
| | | | | | | | | |
| | | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: R Date: 07/12/11
 QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|----------|----------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------|--------------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| 07/11/19 | H 6.0 | one Guide ASS. make the D3572-3's too far apart. (0.172 instead of 0.125) R.L. wrong spacing. Hummer error | VE 07.12.05 | Remove the affected D3572-3. Re weld it Re weld it correct location as per Q51004 | FC 07/12/04 FC 07/12/04 | ↓ Hizlos 07/12/05 | VE 07.12.05 | ↓ 07/11/19 |
| 07.11.19 | b.0 | D3572-3 0.155" apart instead of 0.125" | VE 07.11.19 Q51042 | Acceptable. | VE 07.11.19 Q51042 | ↓ Hizlos | VE 07-11-19 Q51042 | ↓ Hizlos |
| Hizlos | # 80 | one Bar was found to have a pin hole in the welding. Jarring cleaning prior to P/C. | Q51042 | Scrap entire Bar. No replace | SAN 07-12-06 | ↓ Hizlos | Q51042 | ↓ Hizlos |

NOTE: Date & initial all entries

